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A Comparative Analysis of International Teacher Preparation Programs
Senior Project

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By

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Abstract

Teacher preparation is the foundation of any society's education, so the various aspects of an educator's preparation can play critical roles in the outcome of his or her pupils learning. Looking at the top performing countries in eighth grade math from around the world using the Trends in International Mathematics and Science Study (TIMSS), Japan, Israel, Finland, Untied States and England must be implementing unique tactics during teacher preparation that have enabled them to be among the top ten performing countries. This article looks at certain variables that are possibly impacting the quality and outcome of teachers' performances, such as a teacher's student teaching experience, the variety of preparation programs available, teacher salary and other significant factors.

A Comparative Analysis of International Teacher Preparation Programs

In a fast growing society, demands for a higher understanding of communication and social needs as well as an education in science, technology, engineering and math (STEM) are essential to job marketability. Narrowing down the source to what makes an individual adequate for any present society leads researchers to investigate an individual's primary education and educators, asking questions such as: Who are they? Are they equipped to teach? These types of subjects lead researchers to question if the preparation of these individuals was sufficient to meet the daily demands of today's economic climate. A look at an international study on Mathematics and Science, conducted by the Trends in International Mathematics and Science Study (TIMSS) in the year 2011, will reveal the top performing students in these subject areas. Through this test, this paper will analyze the teacher preparation from a set of five countries out of the top performing countries from around the globe.

In particular, the following are the countries that will be analyzed in this paper: Japan, Israel, Finland, Untied States and England. These countries were chosen with the intent to obtain a variety of approaches from around the world rather than a concentrated area. In the TIMSS, the top performing countries were all located in East Asia (Mullis, Martin, Foy, & Arora, 2012). However, this analysis is intended to obtain a view of distinct cultural educational systems in order to effectively compare them.

Literature Review

TIMSS Findings

The Trends in International Mathematics and Science Study (TIMSS) was founded in 1998 and provides international competency testing in Math and Science in sixty-three countries (Mullis et al., 2012). This test is on a scale from 1 to 1000, with 500 being the average, and most countries score between 300 to 700 (Mullis et al., 2012). For the purpose of this study, the scores of eighth grade students' mathematic achievement were analyzed. Out of the top ten countries, Japan scored 570, Israel 516, Finland 514, United States 509 and England 507.

The TIMSS reported on certain concepts related to algebra, geometry and arithmetic that were noteworthy. Algebra appeared to be the strongest form for students across the globe, while only ten countries were successful in geometry, which goes hand in hand with the fact that "more countries demonstrated relative strengths in knowing mathematics (i.e., recalling, recognizing, and computing) than in applying mathematical knowledge and reasoning" (Mullis et al., 2012, p. 11). Algebra is recalling, recognizing, and computing, while geometry is reasoning and mathematical knowledge; therefore, it appears as if teachers are lacking the ability to teach critical thinking.

Moreover, there exists a correlation with teacher satisfaction and test scores given how the higher the satisfaction of teachers, the higher the test scores (Mullis et al., 2012). Teacher satisfaction was directly measured by statements that participating teachers answered in a survey. In addition to this, other components such as teacher salary and teacher preparation programs available possibly influence the overall satisfaction of educator. These topics are further investigated

in this paper.

Data Review of TIMSS

For this research, there are multiple factors that were available for each country that perchance sway teacher preparation and the outcome of the student's learning. While there exist endless number of factors that play a role in teachers' effectiveness, naming them all would be impossible. However, comparing and analyzing the availability of programs, teacher salary and how high-ranking educators consider their jobs has formulated a more concrete view that can positively or negatively impact teachers' performance in the classroom.

A significant consideration in teacher preparation is tracing the programs available for teacher candidates to apply to. When comparing the United States with other countries, there are abundant programs available for teacher preparation in the United States, even when comparing it based on the populations size.

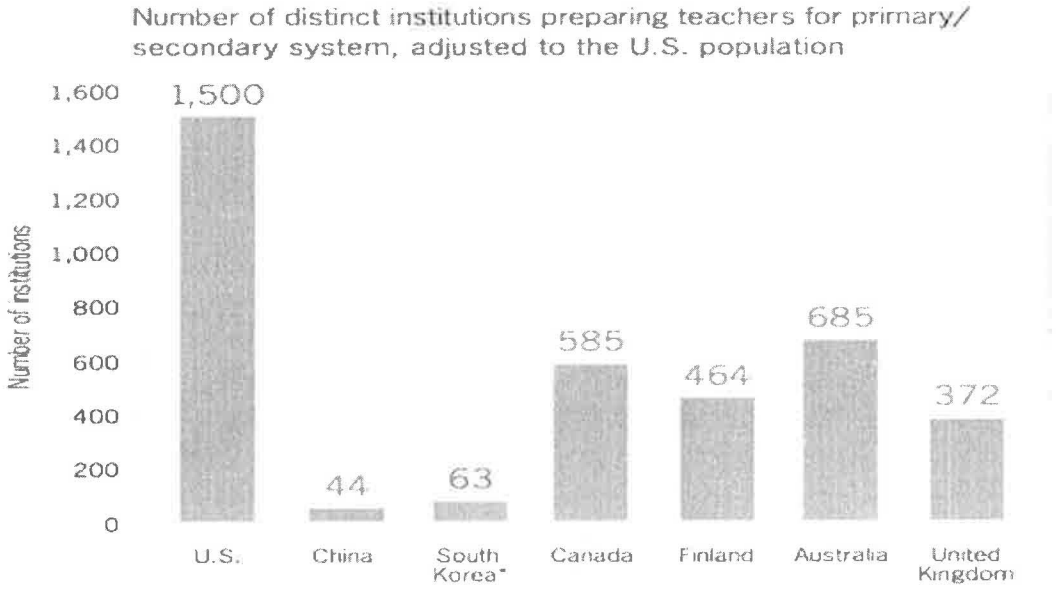

Figure 1 Greenberg, J., Walsh, K., & McKee, A. (2015). *2014 Teacher prep review.* Washington, D.C.: National Council of Teacher Quality.

Figure 1 shows that Finland and the United Kingdom have less than a third of the number of programs in the United States. Based on the number of programs in China and South Korea, it is safe to assume that Japan would also have less than a third of the number of programs in the United States (Greenberg et al., 2015), which can lead to doubts concerning the quality of more programs available for teacher preparations. Perhaps it is possible for a government to establish and maintain a high quality to all the programs in the United States, yet many of the programs are not easily manageable or well managed.

Teacher salary also influences teacher quality in multiple ways particularly since teacher salary impacts the satisfaction of a profession. As previous mentioned, the higher teacher satisfaction, the better the test scores. When looking at the ratio of teacher salaries to GDP per Capita in 2003, the United States is at 117%, Japan 160%, England at 140% and Finland 129% (Ladd, 2007). This data indicates that teachers are clearly valued and earn more in Japan, which is reinforced when looking at the TIMSS because this country had the highest test scores. Ladd (2007) concluded that higher salaries accounted for lower percentages of under qualified educators and where salaries were higher for specific fields, such as math and science, there was a shortage of educators.

Further investigating teachers, there exists a positive correlation between the value educators give their profession and learners performing higher academically on the Programme for International Student Assessment (PISA), which is another international educational test for comparison.

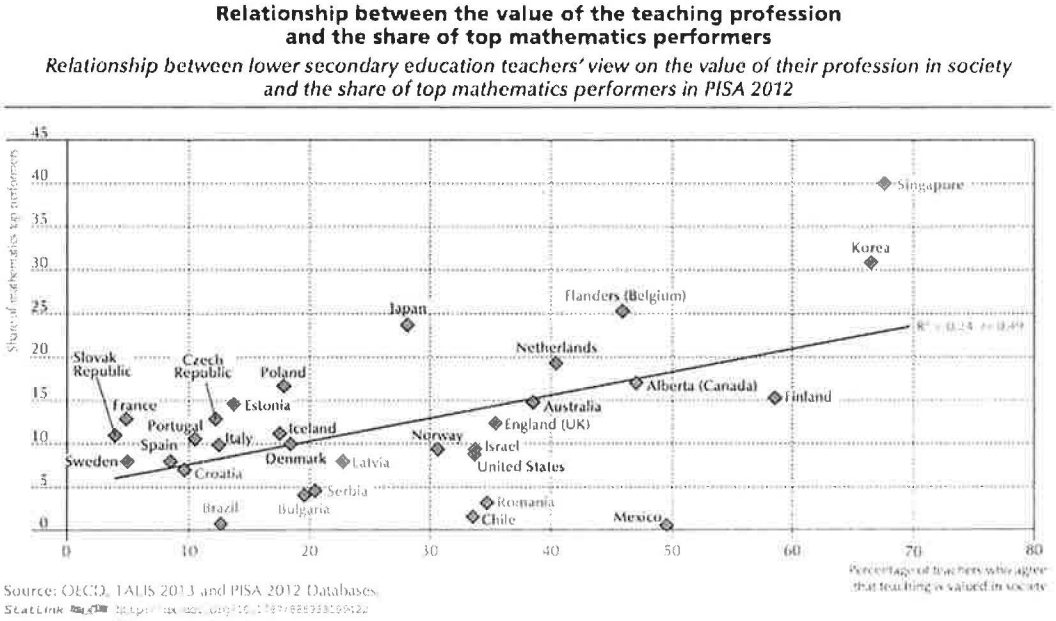

Figure 2 Schleicher, A. (2015). Schools for 21st-century learners: Strong leaders, confident teachers, innovative approaches, International Summit on the Teaching Profession, OECD publishing. http://dx.doi.org/10.1787/9789264231191-en

Figure 2. demonstrates that teachers from the United States, Israel and England do not feel as valued as Finland teachers; similarly, their test scores are lower, too (Schleicher, 2015). When looking at the TIMSS, Finland scored third highest of the five countries that are considered in this research, and the United States, Israel and England scored relatively close. Japan is an outlier in this scenario with teachers feeling depreciated and higher test scores.

Teacher Preparation in Individual Countries

Japan

Out of the five countries analyzed in this research, Japan scored the highest on the TIMSS. Information found on Japan's teacher preparation was limited, but learning that they are well paid and only have a few teacher preparation programs has been resourceful. When considering the income they earned more as an educator and how they did not have an abundance of teacher preparation programs, it can be concluded that earning more and closely monitoring might be a reason for success. While information on teacher preparation before teaching was not found in this research, it is noteworthy to say that Japan has a unique way of constantly preparing an educator throughout the school year.

An aspect of the success of Japan's teachers that is continuously found through research concerns the teacher collaboration that exists in the schools. In fact, an account of a foreign teacher in Japan's school system details the importance of the *shokuin shitsu,* an environment where teachers interact and collaborate on a daily basis (Ahn, 2014). Even though Japanese programs only provide four weeks of student teaching, their first years teaching are closely observed and guided in the *shokuin shitsu.* This collaboration is described as "groups of teachers review their lessons and how to improve them, in part by analyzing student errors, provides one of the most effective mechanisms for teachers' self-reflection as well as being a tool for continuous improvement." (Schleicher, 2015, p. 54). Additionally, the number of first year teachers that quit is under two percent, which shows that there is an aspect of their training or environmental support that motivates them to continue as an educator. (Ahn, 2014). This type of support is a backbone that is essential for

the growth of a first year teacher.

Israel

As may be foreseen, the education in Israel has its own unique characteristics that drive it to be successful. In its colleges, there exists a centralized educational system and nation-wide curriculum that focuses primarily on the academic development of the country's professionals (Hollenbeck, Ezer, & Mevorach, 2014). The degree the future educators earn is call a Bachelor of Education with a concentration in teaching practices and pedagogy, hence placing major focus on the education aspect rather than an academic aspect such as math or science.

Although academics are emphasized, they are not the only aspect of teaching that defines an effective educator. Through a study comparing Israel with the United States, it found that "the acceptance of the other, multiculturalism and the love of mankind" was a critical part of teaching (Hollenbeck et al., 2014, p. 285). The Israel culture might be the one that encourages this type of environment when teaching. Multiculturalism comes with its rewards by allowing students to become critical thinkers of their surroundings rather than denying or accepting it. Thus, when applying to math in this case, students will rather think and apply than accept and remember formulas or algorithms leading to higher performance on the TIMSS. It is probable that teaching in a manner such as Israel does has a constructive result on students learning.

Finland

Unlike those in many other countries, Finnish programs have an extra demanding curriculum and different approach to become an educator. To begin

with, Finnish teachers are required to earn a masters to become an educator, which requires more education than the other countries' requirements, and they have to go through an interview and a test to become accepted into the Education program (Evagorou, Dillon, Viiri, & Albe, 2015). Higher expectations from future educators motivate talented and willing educators while filtering out the discouraged, unfit educators that might be resorting to education as a last choice. In total, teachers study for five years, become employed after studies and the government pays for their education (Evagorou et al., 2015). The rewards of employability and paid tuition are the tangible aspect of the Finland teacher preparation program, while becoming effective thinker is also achieved.

Educators take a different approach to teaching, since their "teacher education is research-based, which means that teachers are encouraged to adopt a research-orientated approach toward their work, to be analytical and open-minded, to draw conclusions based on observations and experiences and to develop teaching skills and methods in a systematic way" (Evagorou et al., 2015, p. 103). This allows teachers who are capable of thinking for themselves to become problem solvers based on their research that could be positively influential in a classroom. Finnish students finally graduate by completing research assignments, written exams, student teaching and completing their Master thesis (Schleicher, 2015). Most teachers become a teacher that will eventually retire in that same profession. In summary, the process to become an educator is one that requires hard work and dedication, which follows from Finland's TIMMS scores and demonstrates the

reason for their dedication to education.

United States

Teacher preparation in the United States varies greatly due to the larger number of teacher preparation programs. There exists a scarcity for educators in the United States, especially for Mathematics, which has resulted in an abundance of teacher preparation programs that are poorly regulated. According to a national study of teacher preparation programs, less than half of the teacher preparation programs failed to meet the requirements of a strong math program when compared to higher-performing countries, and "[m]ore than half of the teacher preparation programs in the U.S. currently lack professional accreditation, relying only on their college's or university's general – and insufficiently focused – accreditation status to certify their quality" (Greenberg et al., 2015, pp. 3, 12). Famous programs, such as Teach for America, and recognized colleges use their popularity to attract teacher candidates, but doubt exists about the effectiveness of the teacher preparation program. For example, Teach for America recruits people to become educators in needed schools and offer a month of intensive training, yet that is not proper or sufficient teacher training.

Also, the numerous programs lack adequate requirements for admission to the programs and proper student teaching experiences. Three out of four programs lack rigorous requirements for becoming future educators by not even requiring them to be in the top 50 percent of the college community (Greenber et al., 2015). If the future educators are only required to be less than average compared with the current college population, the United States will deliver inexperienced teachers in

the classroom. Grade point average is critical when considering admittance into the programs, but are not the only concerning aspect. Academic proficiency test are not popular in consideration to admittance into teacher preparation programs. Currently, there are only 29 states that require an academic proficiency test (Greenberg et al, 2015). An example of this type of test is the Praxis, which is an academic test covering math, reading, and writing that is required to be passed in order to gain admittance into a teacher preparation program in North Carolina. Additionally, student teaching in the United States needs improvement. Whether student teachers are student teaching in a professional environment with collaborative and responsive teachers is uncertain because currently only five percent of the programs from the study have the "basic components" for an effective student teaching experience (Greenberg et al., 2015, p. 4). The United States overall needs to change its focus from producing numerous, inadequate educators to effective, well-prepared educators.

England

Finally, England, the country with the lowest score out of the five countries in this research, has a similar case to the United States. England has a teacher shortage issue, and, consequently, the government has implemented incentive programs and effortless entrance to teacher preparation programs (Ladd, 2007). As of the year 2010, there exist nine different paths to becoming an educator, such as earning a Bachelor of Education or add-ons called qualified teacher status (QTS) and one year full-time certificate in education (PGCE) (Evagorou et al., 2015). In other words, the quality and expectations of future educators has been decreased.

Becoming a teacher in England is not as complicated as the previously mentioned countries. In England, it takes an average of four years to become a teacher, with no licensure being required after graduation and the government pays for their education (Evagorou et al., 2015). In addition, due to the teacher shortage, it is relatively easy to be accepted, and employment is guaranteed after graduation (Evagorou et al., 2015). These simpler steps to becoming an educator might increase the number of teachers, but the efficiency of them is still left to question.

Further Research

Due to limited time and resources available, some data was not equally available for each country. Narrowing down to specific universities or programs was not possible due to limited resources, as well. Israel, in particular, was not included in most studies found during this research. In order to understand more about what makes Israel a top performing country, further research is necessary. Moreover, it is crucial to acknowledge that there exist multiple factors that effect teacher's effectiveness and test scores on the TIMSS, this paper is only intended to look at a couple few factors.

Analysis of the Research

In conclusion, teacher preparation internationally varied accessibility of a program to the expectations of the teacher's knowledge once in the classroom. To begin with, Japan had the highest score in mathematics. After this research, it is no surprise because teachers in Japan are held at a different standard than the other countries because teachers feel valued and appreciated. There are only a limited number of programs available for teacher education and teachers earn the most out

of the countries. However, it is the *shokuin shitsu* that makes the real difference in teaching. Novice teachers are not left alone to handle lesson plans, teaching methods, and other demands of the classroom on their own. Meanwhile, experienced teachers are constantly improving and sharing ideas with new and older teachers. This type of environment is one that nurtures the beginner teacher and offers the support needed for effective lesson plans and exceptional results from the students.

Moreover, looking at Israel is important because it offers another international perspective on teacher preparation given how it stressed aspects other than academics. Israel was found to teach in a manner that encourages multiculturalism, which is so far the only explanation for the higher test scores on the TIMSS. Students are focused on thinking, being critical rather than being passive learners. Furthermore, teachers do not feel valued, which explains why they could be lacking recognition or higher salaries as well to improve their teaching. Further research is needed in order to draw parallel conclusions of the top ten performing countries on the TIMSS.

A more elusive country to analyze its teacher preparation when in comparison with its TIMSS scores is Finland. Finland provides what appears to be a rigorous task of joining a School of Education and requires a Masters degree to teach. Educators feel like they are highly valued when compared with many other countries including Japan, the highest scoring country in this research. Finland and Israel have relatively similar test scores; therefore, there must exist an aspect of teacher preparation or teacher practice in Israel that is clearly making a greater

difference in Israel that Finland is lacking, keeping in mind Israeli teachers do not feel as valued as Finland teachers and make less than them, too. A downside of Finland's teachers is that the teacher pay is not the best in the country, but that is only one smaller detail when comparing it with the United States and England, which have numerous disadvantages to their teacher preparation and overall teacher effectiveness. Finland has a challenging teacher preparation program, but is possibly in need of more teacher collaboration or orientation such as in Japan.

The United States has a ridiculously large amount of programs that offer teacher preparation when compared with the other top countries. This not only implies that the programs are more feasible to be inadequate management and poor regulation, but that there does not exist much competition into the programs because there are so many options. To make matters worse, admission in the School of Education is not as rigorous as other careers. Tests, such as the Praxis, are a new requirement that elementary educators are just now starting to see. Low grade point averages are acceptable to get into a program. How are the students learning from effective educators, if they were accepted by grades that were barely enough to get by in college? Another pending issue is teacher salary. The United States along with Finland have the lowest paid educators out of the five countries in this research. Salary, in the United States, stands for a social status and the income of educators is not highly admired, thus teachers feel less valued. In the aspect of mathematics, the best mathematician are choosing the higher paying careers rather than sharing their knowledge with future generations. It is obvious that teacher

preparation in the United States needs to be more demanding and closely monitored, rather than attempting to produce numerous, incompetent teachers.

Another similar case to the United States is England. England scored the lowest out of the five countries mentioned; yet, teacher value and salary are higher than Israel and the United States. However, there exists a teacher shortage, which prompted a simpler process in becoming an educator. There are not licensure test needed and finding a job after graduation is likely. Their government more than likely needs educators, but providing incentives and other means of becoming teachers is hurting the overall country's learning. Deducing from Japan and Israel, England is in dire need of a teacher support program that guides them through their first years teaching and require an active approach to learning by encouraging multiculturalism.

It is clear that demanding teacher preparation programs, feeling valued and earning higher salaries is not sufficient to create or motivate effective educators. They are crucial considerations that any government should provide for the educators; however, the essential and necessary attentions are that of creating a nurturing environment for teachers throughout the teaching experience. Looking at Japan, for example, shows how teachers should be constantly learning, improving and growing because doing so has resulted in an obvious effective teaching and testing scores skyrocketing when compared with the other countries in this research. Countries, additionally, need to provide an environment that is accepting and in its own way nurtures the teacher and student to be accepting of one another and reflective to create active learners. In order to achieve this, a research-based

teacher preparation is a suggestion because it will allow future educators to analyze a situation and use their knowledge to best handle a circumstance in the classroom. Aspects such as these make an effective teacher, but a teacher never stops learning. Teacher preparation is only a warm-up exercise for teachers; the real deal is when they are teaching in front of a classroom with children who have multi-learning styles.

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